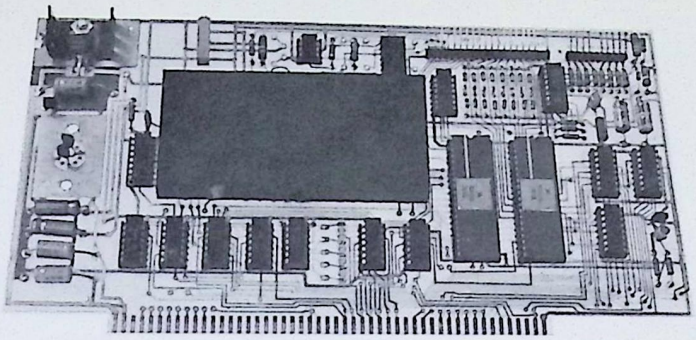
88-Analog-to-Digital Converter



The 88-Analog-to-Digital Converter is a high accuracy conversion card that translates real-world analog signals into 12-bit binary signals and inputs them into the Altair computer. The 88-ADC can be used for many scientific and industrial applications such as monitoring pressure, temperature or linear position transducers, light or frequency sensors and instrumentation amplifiers. It can also be used for personal applications such as remote control devices, video games and computer graphics.

Circuitry Design

The heart of the 88-ADC is the analog-to-digital converter module which contains virtually all of the circuitry needed to represent analog voltage as a 12-bit binary value. In addition, the 88-ADC includes:

1. A buffer amplifier which can be set for a gain of up to 1,000 (with a true differential input instrumentation amplifier option, AD521, to track signal increments smaller than 50 mv)*
2. An 8-channel multiplexer (used to select one of eight input signals)**

The remaining circuitry is used for addressing and timing.

Special Features

The 88-ADC is capable of either unipolar or bipolar operation at a voltage range of:

Unipolar: 0 to + 5v
0 to + 10v
} 8-channel multiplexer or 88-MUX system†

Bipolar: − 5 to + 5v
− 10 to + 10v (Direct input to buffer amplifier only; no MUX)

The 88-ADC also provides vector interrupt capability so that the 88-ADC board can be read at fixed "real" time intervals asynchronous to program execution.

Capabilities

The 88-ADC operates with a maximum conversion time of 65 microseconds†† at an accuracy rate of:

Quantizing Error: ± 1/2 LSB
Nonlinearity: ± 1/2 LSB
Offset: Externally adjustable to zero

The 88-ADC has an input impedance of 1 megohm (100 megohms with 88-ADC Option #1) and operates with the following stability coefficients:

Offset vs. Temp: 20 ppm/°C (max)
Gain vs. Temp: 80 ppm/°C (max)
Nonlinearity vs. Temp: 20 ppm/°C (max)
Gain vs. Supply Voltage: ± 30 ppm/%Vs (max)

Power Supply Requirements and Temperature Ranges

The 88-ADC requires voltages of:

+ 5v at 500 mA
+ 15v at 25 mA
− 15v at 30 mA

The operating temperatures for the board range from 0 to 70°C and storage temperatures range from − 40 to 100°C.

*Specify 88-ADC option #1 (AD521) when ordering.

**An optional 24-channel multiplexer (88-MUX, see other side) can be used to replace the on-board 8-channel multiplexer.

†By adding two resistors per channel on an 88-MUX card, larger voltages can be scaled down according to the user's application.

††Module time only; processing time is not included. The sample program provided with the card can read and store data at a maximum rate of 65 microseconds/12-bit sample (approximately 50 microseconds/8-bit sample).

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